

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of : Confirmation No. 7767
Weitbruch, Sebastien : Group Art Unit: **2628**
Serial No. **10/625,328** : Atty. Dkt: **PD020074**
Filing Date: **07/23/2003** : Examiner: **Cashera, Antonio A**
For: METHOD AND DEVICE FOR PROCESSING VIDEO DATA FOR DISPLAY ON
A DISPLAY DEVICE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE

Dear Sir:

Response to the Office Action mailed January 31, 2008 in the above-identified patent application is timely due April 30, 2008. Accordingly, the present response is deemed to be timely filed. Should there be any fees due and owing with respect to this amendment and response, the Office is authorized to charge such fees to deposit account no. 50-3208.

Amendments to the Claims begin on Page 2 of this paper.

Remarks begin on Page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior version, and listings, of claims in the application:

Listing of Claims:

1. (PREVIOUSLY PRESENTED) A method for processing video data for display on a display device having a plurality of luminous elements comprising:
 - applying a dithering function to at least part of said video data, wherein the dithering improves a grey scale portrayal of video pictures of said video data,
 - computing at least one motion vector from said video data,
 - changing at least one of the phase, amplitude, spatial resolution and temporal resolution of said dithering function in accordance with said at least one motion vector when applying the dithering function to said video data;
 - and
 - outputting the dithered video data to a display device.
2. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein said dithering function includes two spatial dimensions and one temporal dimension.
3. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein said dithering function includes the application of a plurality of masks.

4. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein said applying of said dithering function is based on single luminous elements of said display device.
5. (PREVIOUSLY PRESENTED) The method according to claim 1, wherein said dithering function is a 1-, 2-, 3- or 4- bit dithering function.
6. (CURRENTLY AMENDED) The method according to claim 1, wherein said at least one motion vector is defined for each of a pixel or cell individually.

7 – 16 (CANCELLED)

17. (CURRENTLY AMENDED) A device for processing video data for display on a display device having a plurality of luminous elements, said device comprising:

dithering means for applying a dithering function to at least a part of said video data to refine a grey scale portrayal of video pictures of said video data; and

motion estimations means connected to said dithering means for computing at least one motion vector from said video data, wherein at least one of a phase, an amplitude, a spatial resolution and a temporal resolution of said dithering function is changeable in accordance with said at least one motion vector.

18. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said dithering function used by said dithering means includes two spatial dimensions and a temporal dimension.
19. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said dithering function of said dithering means is based on a plurality of masks.
20. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said dithering function of said dithering means is based on a single luminous element, said single luminous element called a cell of the display device.
21. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said dithering means is able to process a 1-, 2-, 3- or 4-bit dithering function.
22. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said at least one motion vector is definable for each pixel of the display device individually by said motion estimation means.
23. (PREVIOUSLY PRESENTED) The device according to Claim 17, wherein said at least one motion vector includes two spatial dimensions.
24. (PREVIOUSLY PRESENTED) The device according to Claim 17, further comprising gamma function means connected to said dithering means, so that the input signals of said dithering means are pre-corrected by a gamma function.
25. (PREVIOUSLY PRESENTED) The device according to Claim 17, further comprising controlling means connected to said dithering means for

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controlling said dithering means temporally in dependence of frames of said video data.

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STATUS OF THE CLAIMS

Claims 1 – 6 and 17 -25 are pending.

Claims 1 – 6 and 17 -25 stand rejected.

Claim 6 and 17 have been amended.

Claims 7 – 16 were previously cancelled, without prejudice.

REMARKS

Claim Objections

Applicants appreciate the Examiner drawing attention to informalities requiring correction regarding claims 6 and 17. Applicants have amended Claim 6 and 17 and withdraw of the objection by the Examiner is respectfully requested.

35 U.S.C. § 103 Rejection

Claims 1, 2, 4-6, 17, 18, 21-23 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin (U.S. Patent 6,421,466) in view of Frey (U.S. Patent 5,925,875).

The rejection of claim 1 is respectfully traversed for the reasons set forth below.

In view of the differences between the respective technical fields of Lin and Frey, one of ordinary skill in the art would not find it obvious to seek to combine Lin and Frey. Lin is in the field of techniques of motion estimation for digital video compression, and is classified in US Class 382, subclass 236. In contrast, Frey relates to planar arrays of sensors, and is classified in U.S. Class 250, subclass 208.1. The Examiner does not proffer any rational basis for one of ordinary skill in the art to

combine these references from two entirely disparate fields of endeavor. In view of this reason, the rejection fails to provide a proper *prima facie* case of obviousness.

The rejection is traversed on further grounds that, as the prior art teaches the use of dithering for entirely different purposes from that recited in claim 1. For this additional reason, the rejection fails to provide a proper *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, all of the recited claim limitations must be taught or suggested in the prior art. See, MPEP 2143.03; see also, *In re. Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Frey discloses an apparatus for reducing fixed pattern noise in an image observed by an array of detectors. It comprises a plurality of image-responsive detectors for creating image signals, dithering means for scanning the observed image across the detectors, temporal high-pass filtering and image restoration means for generating a reconstructed image based on the filtered signals. With due respect the Examiner's interpretation that "...shifting of the reference image signal is functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data" is simply not relevant. It would not have been obvious for one of ordinary skill in the art to apply Frey to the problem of using dithering as a means of increasing the number of video levels of a pulse width modulated display to refine the gray scale portrayal of video pictures. Frey adds a dithering pattern to remove a fixed pattern noise (see column 3, lines 5-8). In fact Frey actually adds the dither before computing motion speed as contrasted to claim 1, where dithering is motion compensated before being

added. Consequently, some parameters of the dithering function can not be interchanged in accordance with the estimated motion.

Applicant further submits that the present 35 USC 103 rejection in view of Lin and Frey fails to provide a rational underpinning to support the legal conclusion of obviousness. In particular, the prior art teaches respectively a video compression system and a planar array having entirely different structure, which one of ordinary skill would not combine to achieve a central object of the present invention i.e., to help achieve requisite changes in certain parameters (phase, amplitude, spatial resolution and/or temporal resolution) of the dithering function in accordance with computed motion vectors. More precisely, Frey does not disclose a step of applying a dithering function to at least a part of said video data to refine the gray scale portrayal of video pictures of said video data. The dithering operation is only used "to correct the gain and offset errors in the array of detectors" (see column 2, lines 9-11). The dithering means are used "to correct for differences in the responses of the individual image detectors forming the array" (see column 1, lines 13-16). Consequently, one of ordinary skill in the art would never use Frey to increase the number of possible video levels, i.e., to refine the gray scale resolution of video pictures of the video data. Furthermore, in the alternative embodiment illustrated by Figure 12, Frey discloses a dithering device filtering an image performing scene-to-scene registration to measure the object space motion and to estimate a dither pattern from that motion (see column 10, lines 33-45). In this alternative, the motion is used to estimate a dither pattern (see column 10, lines 34-45 and 51-53) and is not used to change some parameters of the dither pattern (or the dithering function) as recited in claim 1.

The Examiner concedes that Lin does not explicitly disclose changing at least one of the phase, amplitude, spatial resolution and temporal resolution of the dithering in accordance with the calculation of the motion vector. However, the Examiner respectfully has not explained how Frey changes at least one of the phase, amplitude, or temporal resolution. Finally, and significantly, the step of displaying the processed video data on a display device in claim 1 is neither taught by Frey, nor constitutes a rational modification of Frey; Frey relates to image detectors, and not to displays.

For at least the above cited reasons, the prior art fails to teach, suggest, or render obvious each of the features recited in claim 1; reconsideration and removal of this 35 USC 103(a) rejection is respectfully requested. The rejection of independent claim 17 should be removed for the same reasons.

Claims 2, 4-6, 18, 21-23 and 25 depend from allowable independent base claims, 1 and 17 respectively, and are allowable at least by reason of their dependence from allowable base claims. As to claims 3, 9 and 14, the rejection based on the combination of Lin, Frey and Correa should be withdrawn for the additional reason that Correa relates to dithering masks having little visibility. Correa is thus in a different field from the planar arrays of sensors of Frey, or the motion estimation for video compression of Lin; there is no rational basis in the rejection for one of ordinary skill in the art to combine Correa with art from two completely different fields. The applicant respectfully requests the Examiner to reconsider and withdraw the rejection based upon 35 U.S.C. 103 (a).

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CONCLUSION

Applicants believe they has addressed all outstanding grounds raised by the Examiner and respectfully submit the present case is in condition for allowance, early notification of which is earnestly solicited.

Should there be any questions or outstanding matters, the Examiner is cordially invited and requested to contact Applicants' undersigned attorney at his number listed below.

Respectfully submitted,



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